

SECTION 1B

Objectives

- ▶ Identify the workers who do technology.
- ▶ Tell how science, engineering, and technology are linked.
- ▶ Explain how teens have contributed to technology.

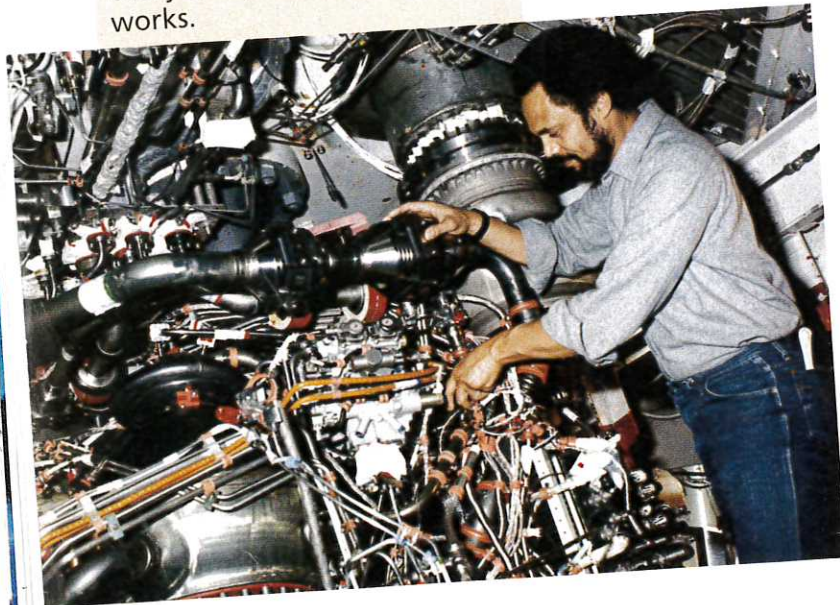
Terms to Learn

- engineering
- science

Standards

- Relationships & Connections
- Influence on History
- Manufacturing Technologies

Figure 1-6 This technologist is working on complex machinery. He knows how every component (part) works.



Making Technology Happen

What are some ways in which technology involves people?

More than anything else, technology involves people. People make things happen. People apply the technology.

The People Who Do Technology

Who are the people who do technology?

The word *technology* comes from the ancient Greek word *techne*, which means “art.” You might think that art means only paintings or sculpture. To the Greeks, it meant much more. They felt it took a real artist to make useful products from natural materials. They never thought that technology abused nature. They believed instead that technology linked nature to the human spirit. Many centuries later, Walter Chrysler, the man who started the car company, expressed the same idea. He said, “Someday I’d like to show a poet how it feels to design and build a railroad locomotive.”

Several terms have been used to refer to people who work with technology. Early workers in technology called themselves *artisans*. It’s still a name we hear from time to time. It referred to a highly skilled worker or craftsman. During the 1800s, the unusual name of *mechanician* was used. From this word came our word *mechanic*. The word *mechanician* also came from a Greek word—*mechanikos*, meaning “machine.”

Two modern names for people who work in technology are *technician* and *technologist*. It is customary to use either word to describe a person who works in technology. See Figure 1-6.

Science, Engineering, and Technology

How are the areas of science, engineering, and technology related?

You may notice that the words *science* and *technology* are often used together. A classmate might say, “I want to study science and technology in school.” Your dictionary no doubt uses the word *science* in its definition of the word *technology*. Although science and technology are related, they’re not the same. **Science** explains how things happen. Technology *makes* things happen.

Scientific effort created electronic microchips. Technology used those microchips to make automatic cameras, DVD players, and many other electronic devices. Scientists discovered nuclear reactions before technologists built nuclear power plants for generating electricity.

People didn’t always need formal science to do technology, however. People made objects out of bronze 5,000 years ago, long before there was a branch of science known as metallurgy. Before the sciences of chemistry and biology were identified, people used certain plants to help cure injuries and illnesses.

Another important profession is **engineering**. It fits between science and technology. Using their knowledge of science and mathematics, engineers determine *how to make* things. See Figure 1-7. For example, chemical engineers working with mechanical engineers design machines that produce plastics and other materials. Civil engineers design bridges and roads. Electronic engineers design communication systems. Chemical, civil, electronic, and mechanical technologists build the products engineers design.

Figure 1-7 Today’s engineers do most of their design work on computers. Some computer programs can also analyze a design and find any flaws in it.



science
knowledge covering general truths or laws that explain how something happens

engineering
profession that involves designing products or structures so that they are sound and deciding how they should be made and what materials should be used

TECH CONNECT SOCIAL STUDIES

An Inventive President

Our presidents are known for many things. One of our presidents was an inventor who had his invention patented. (A patent is a government document granting a person the right to produce or sell his invention. No one else may copy it.)

ACTIVITY Research past presidents and see if you can find which one was granted a patent for his invention.

Teens Contribute to Technology

How have teenagers contributed to the development of technology?

Believe it or not, teens have sometimes made contributions to technology. Have you ever heard of George Westinghouse? He started a company that still uses his name. He is best known for inventing improved brakes for trains. However, when he was only nineteen, he patented a new type of steam engine. It wasn't successful, but he was on his way.

George Washington, our first president, was a self-taught surveyor long before he became a military leader. He assisted in surveying five million acres for the largest landowner in Virginia and helped lay out the city of Alexandria. He was appointed official surveyor of Culpeper County, Virginia, when he was only seventeen. See Figure 1-8.

At fourteen, Elmer Sperry invented a swiveling headlamp for locomotives so that the engineer could see around curves. Although the headlamp wasn't successful, the gyrocompass he later invented was remarkable. Sperry's gyrocompass is still used in all ship and airplane guidance systems.

Good inventions are still being created by young people today. Students at Hampshire College in Massachusetts created the Grease Car, which turns used cooking oil into fuel. See Figure 1-9. Other students there invented a hand braking system for wheelchairs and a scooter-bicycle combination.

Would you like to be an inventor? Ask your instructor for more information about organizations like the National Collegiate Inventors and Innovators Alliance and about competitions like the Odyssey of the Mind and West Point's Engineering Design Contest.



Figure 1-8 As a young man, George Washington surveyed millions of acres of land. The instrument he used was a circumferenter set.



Figure 1-9 This inventor who worked on the Grease Car probably got his start in a technology class like yours.

LOOK TO THE FUTURE

What's in Your Future?

In a feature like this one within every chapter, you will read about exciting advances in technology. These advances may make important changes in our lives. Do you think you can predict (forecast) what some of those changes might be? For example, how could the Grease Car change our lives?

SECTION REVIEW 1B

Recall »

1. What is the meaning of the Greek word *techne*?
2. What is the difference between science and technology?
3. Who decides how big a gear should be: a scientist, an engineer, or a technologist?
4. Who makes the gear: a scientist, an engineer, or a technologist?

Think »

5. The Greeks thought that technology linked nature to the human spirit. What do you think that means?

6. Give two examples of technological advances that did not first require science. Don't use any example from this section of the book.

Apply »

7. **Manufacturing** Manufacture useful products out of raw materials. For example:
 - Tree branches into small wooden items
 - Locally obtained rocks into jewelry or other decorative items
 - Dyed sand into paintings, as done by Native Americans
 - Grass or straw into woven hot pads